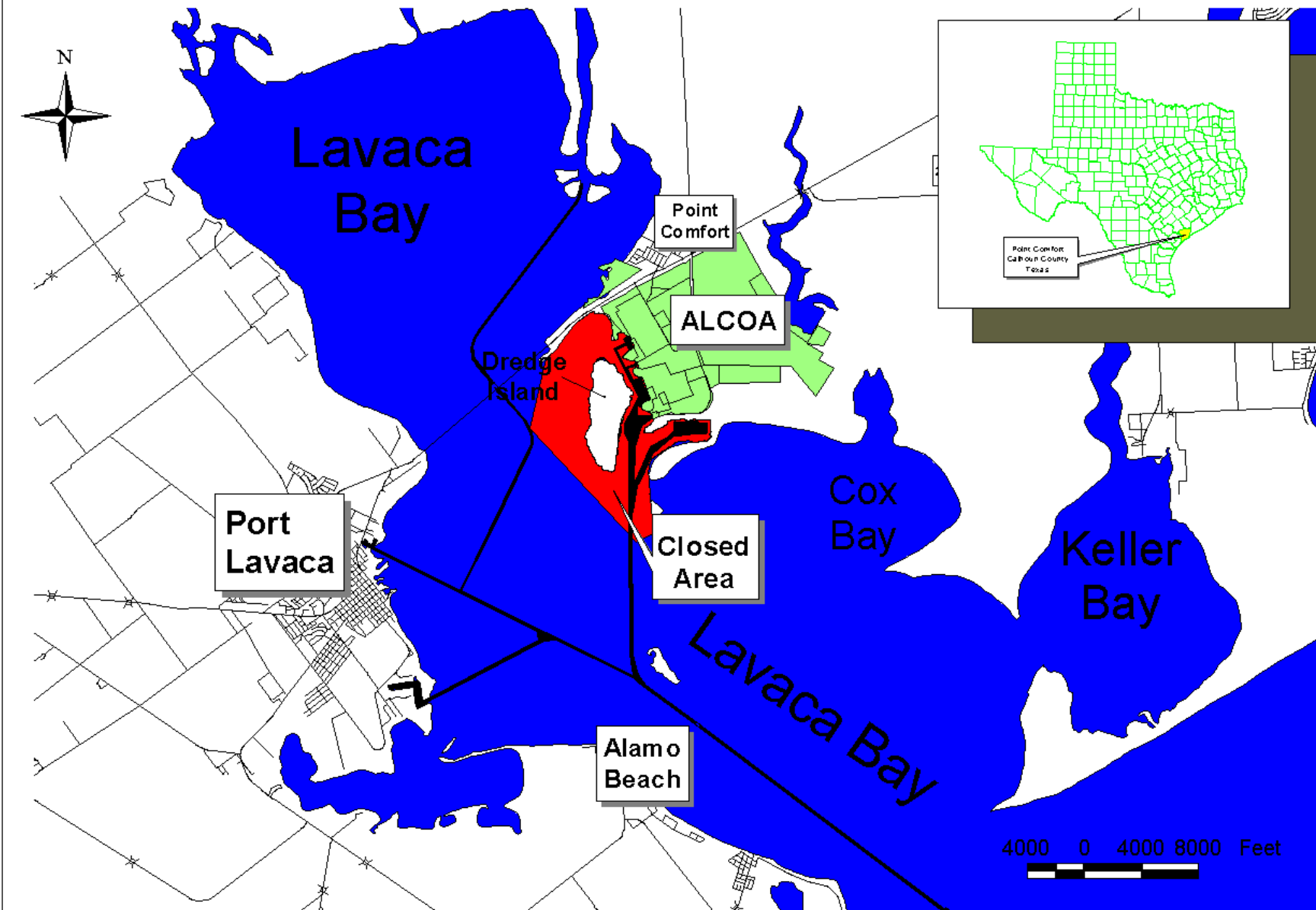


Alcoa/Lavaca Bay Superfund Site

April 25, 2017
U.S. Army Corps of
Engineers
Galveston District



Alcoa/Lavaca Bay Superfund Site



- Population:
 - Point Comfort – 750
 - Port Lavaca – 12,500
 - Calhoun County – 22,000
- Lavaca Bay covers about 65 square miles; Cox Bay about 8 square mile
- Land Use: Industrial
 - Formosa Plastics
 - Calhoun Port Authority
- Lavaca Bay used for recreational and commercial purposes (fishing, shrimping, crabbing and oystering)

Site Description

➤ Background

- Aluminum smelter: 1948 – 1980
- Bauxite refining began in 1959 for production of alumina
- Mercury used at Chlor-Alkali Process Area (CAPA) from 1966 to 1979 for the production of caustic
- Portion of Lavaca Bay Closed by state in 1988; prohibits keeping of fish/shellfish
- Placed on NPL: March 1994
- COCs: mercury and PAHs
- Record of Decision: December 2001
- Construction Completed: July 2007

➤ Five Year Review

- First Five-Year Review signed June 2011
- Second Five-Year Review signed July 2016



Lavaca Bay Sample Results

- Alcoa began sampling water, sediment, biota in 1994 to complete the Remedial Investigation/Feasibility Study (RI/FS)
 - Sediment sampling conducted in open and closed areas of Lavaca Bay
 - Samples collected at surface and at depth
- Remedial action annual effectiveness reports (RAAERS) submitted by Alcoa since 2005
- Current sampling focused on mercury levels in closed area sediment, marsh areas, red drum and blue crab
- Sampling conducted in areas of Lavaca Bay to support evaluation of third-party projects
 - Sargas
 - Excelerate
 - BP pipeline

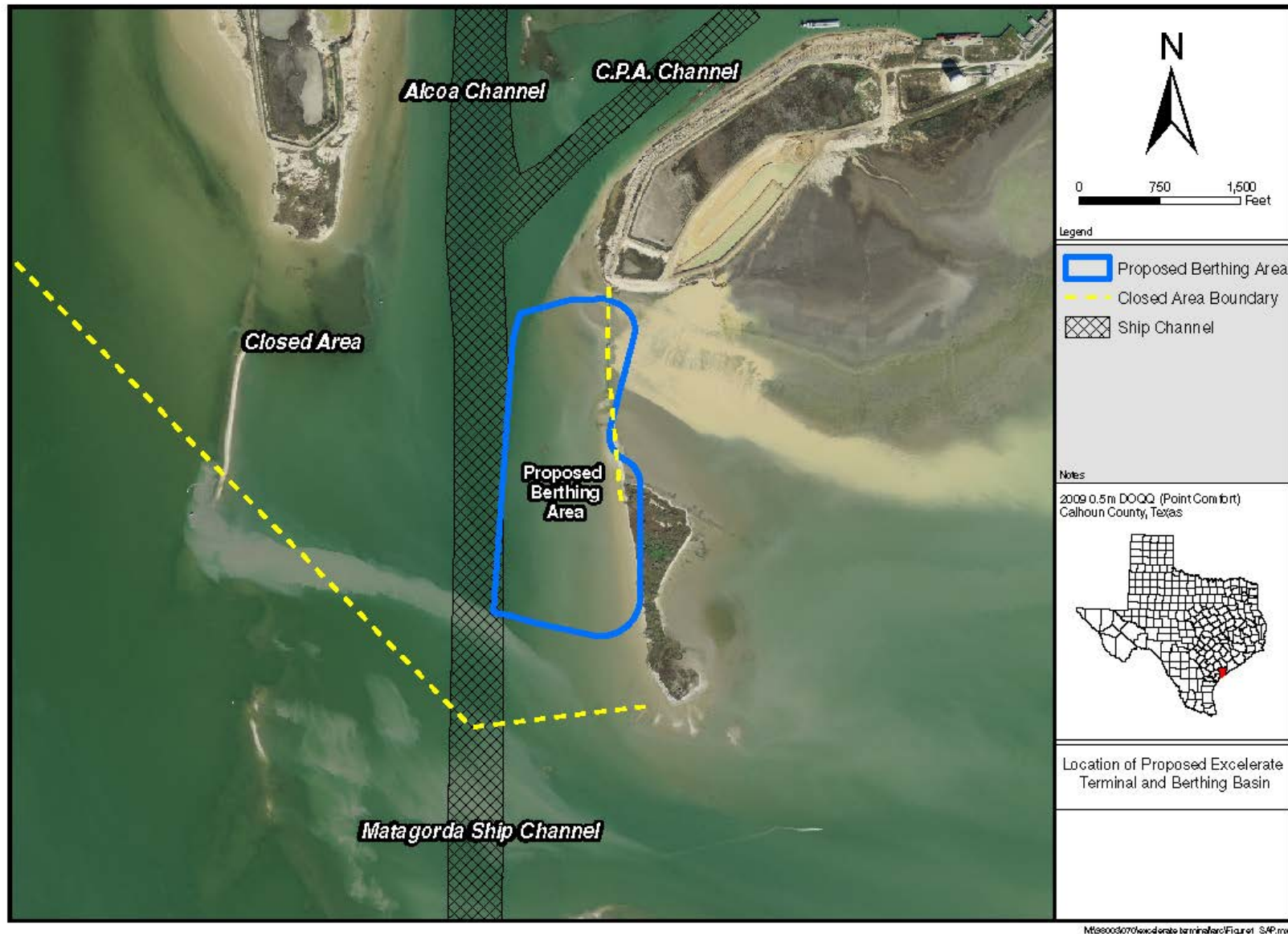
Mercury Concentration in Sediment 5-30 cm RI Sampling 1996



Mercury Concentration in Sediment
30 - 50 cm
RI Sampling 1996, 1997

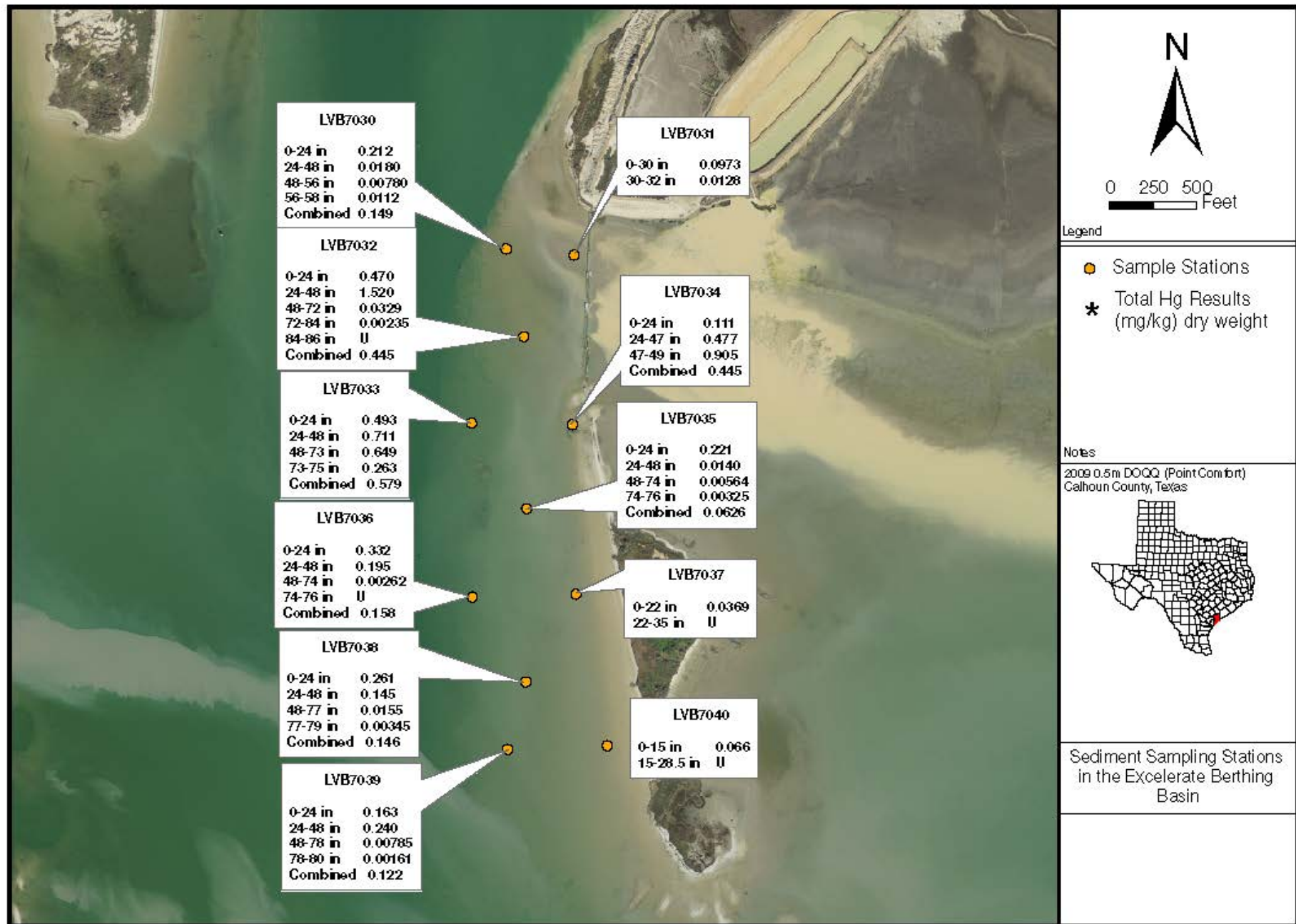


Excelerate LNG Terminal Project



- Sampling conducted in 2013
- Core samples analyzed in 2 foot segments to provide a mercury profile.
- Probe data used to determine the depth of unconsolidated material and the elevation of underlying soil.

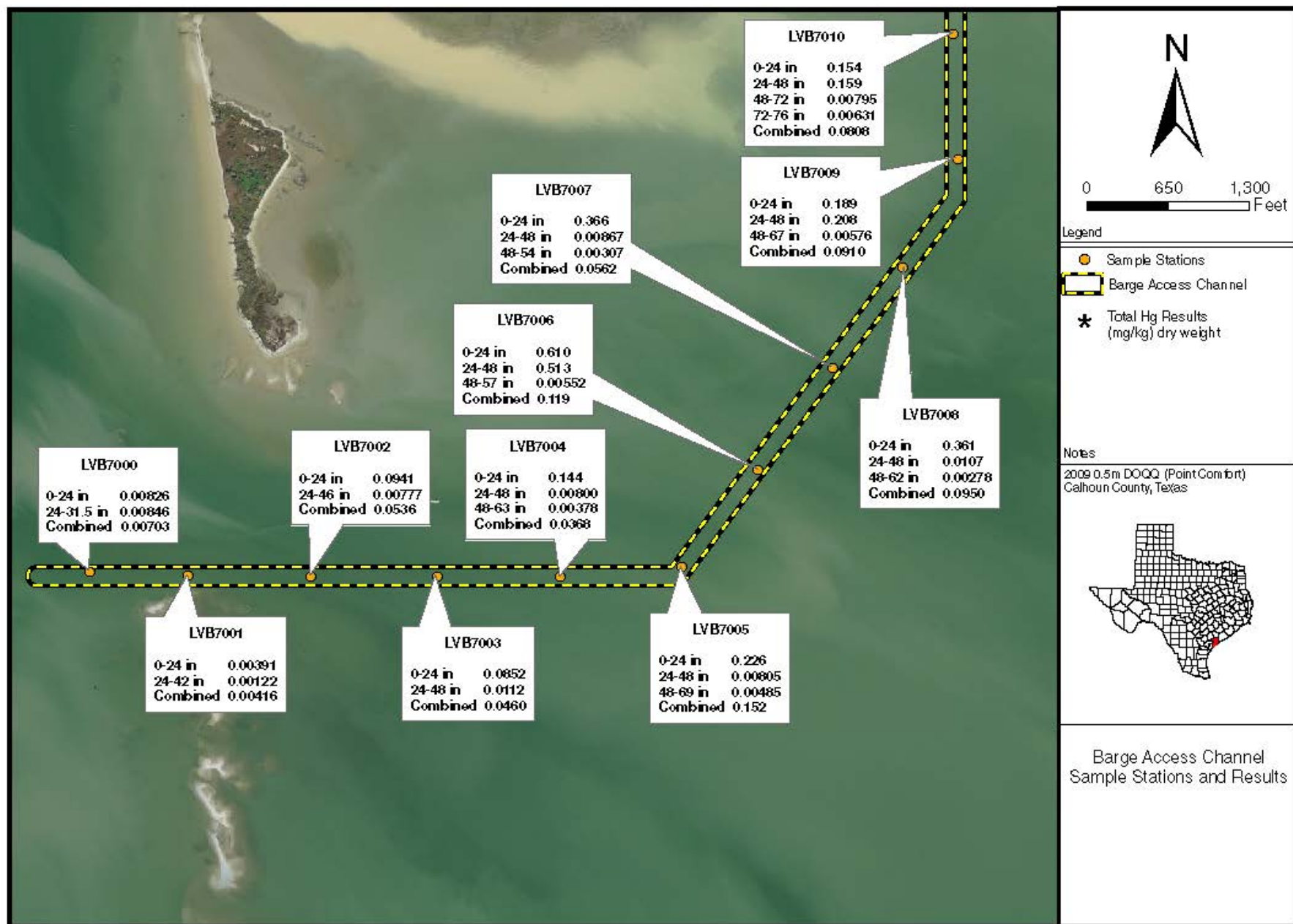
Sampling Results Excelerate Berthing Basin

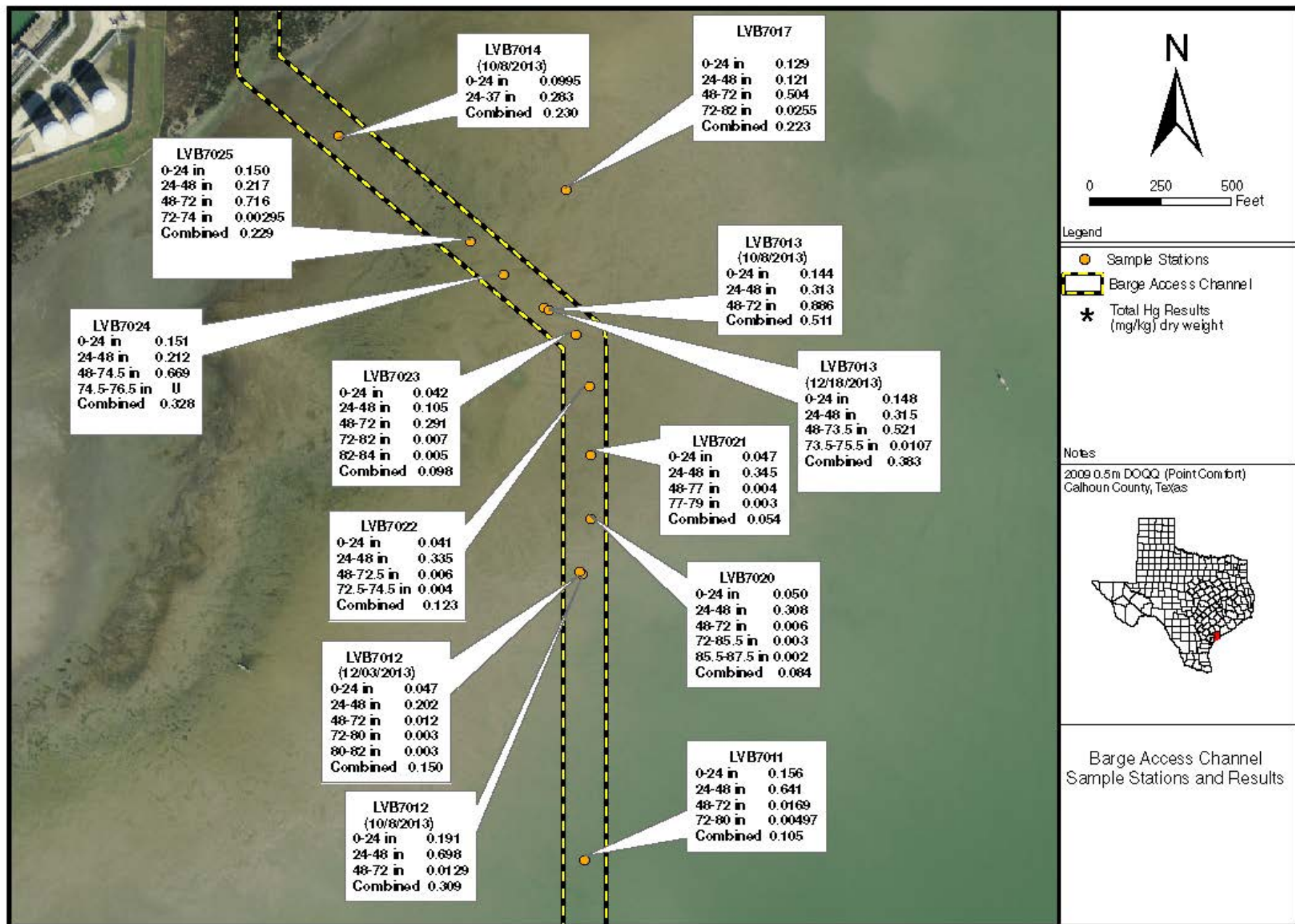


Sargas Access Channel



- Sampling conducted in 2013
- Core samples analyzed in 2 foot segments to provide a mercury profile
- Composite sediment sample (from the surface to the bottom of each core) was collected and analyzed for mercury





Cleanup Activities

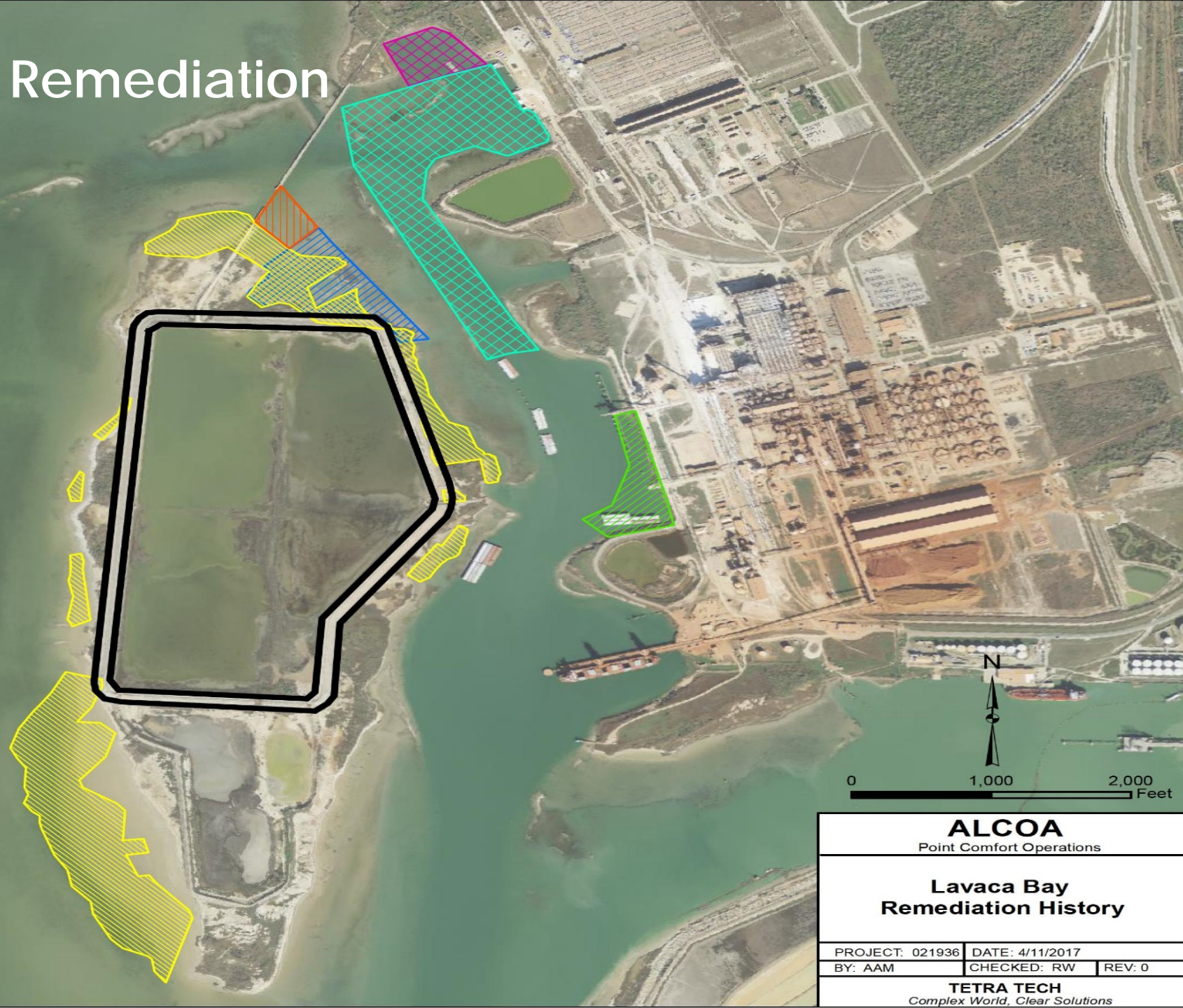
- Removal action at Dredge Island
 - Hydraulic containment system at CAPA
 - Dredging of contaminated sediment
 - Marsh removal north of Dredge Island
 - Natural recovery of areas not dredged
 - Sediment monitoring in open water and marsh areas
 - Fish and prey item monitoring program
-
- Objective: reduce levels of mercury in finfish so fish closure can be lifted
 - ROD estimated fish recovery would occur with 10-15 years
 - Cleanup levels set for mercury in Lavaca Bay
 - 0.5 mg/kg in open water sediment
 - 0.25 mg/kg in marsh sediment





Lavaca Bay Historical Remediation

Remediation dredging projects implemented to selectively remove sediment with elevated concentrations of mercury



Legend

- Disposal Area Boundary
- Dredge Treatability Study-Phase 1 (8/98-8/98)
- Dredge Treatability Study-Phase 2 (1/99-2/99)
- Dredge Island Stability Project (6/99-11/00)
- Witco Channel & Harbor (12/01-1/02)
- Witco Marsh Dredge Project (1/06,3/06-4/06)
- Marsh 14 Dredge Project (6/13-6/13)



ALCOA
Point Comfort Operations

**Lavaca Bay
Remediation History**

PROJECT: 021936	DATE: 4/11/2017
BY: AAM	CHECKED: RW REV: 0

TETRA TECH
Complex World, Clear Solutions

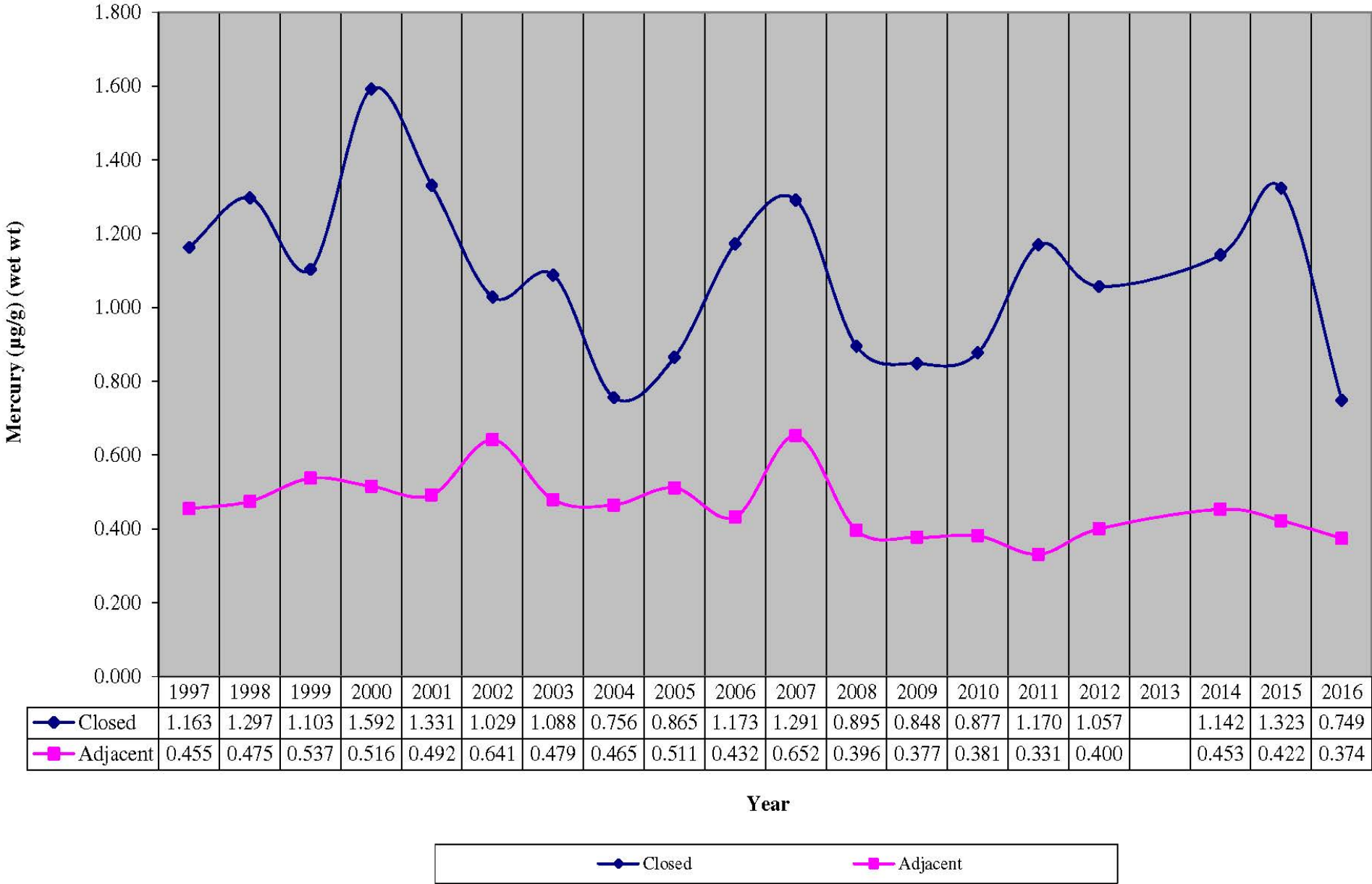


2nd Five-Year Review Findings

➤ Assessment Findings

- Remedial actions are effective in reducing mercury levels in sediment
- Mercury levels in prey items (blue crab) show downward trends
- Levels of mercury in finfish (red drum) continue to remain elevated in the Closed Area
 - Fish mercury levels do not show downward trends
 - Mercury levels in fish show differing trends in the Closed Area
- Residual sources of mercury impacting sediment may exist
- Marshes are potential areas of enhanced methylation even when total mercury levels are low
- Continuing education of the public regarding the fish closure is an ongoing effort

Total Mercury in Red Drum Tissue 1997-2016



Possible Ongoing Sources

In-Place Sediments/Soils:

- Sloughing of sediments on the walls or adjacent slopes of the Alcoa and Witco Channels
- Erosion along edges of Dredge Island
- Erosion of MS3
- Shipping induced resuspension of Witco Harbor sediments
- Resuspension of open water sediments, particularly in Causeway Cove



2017 Response Actions

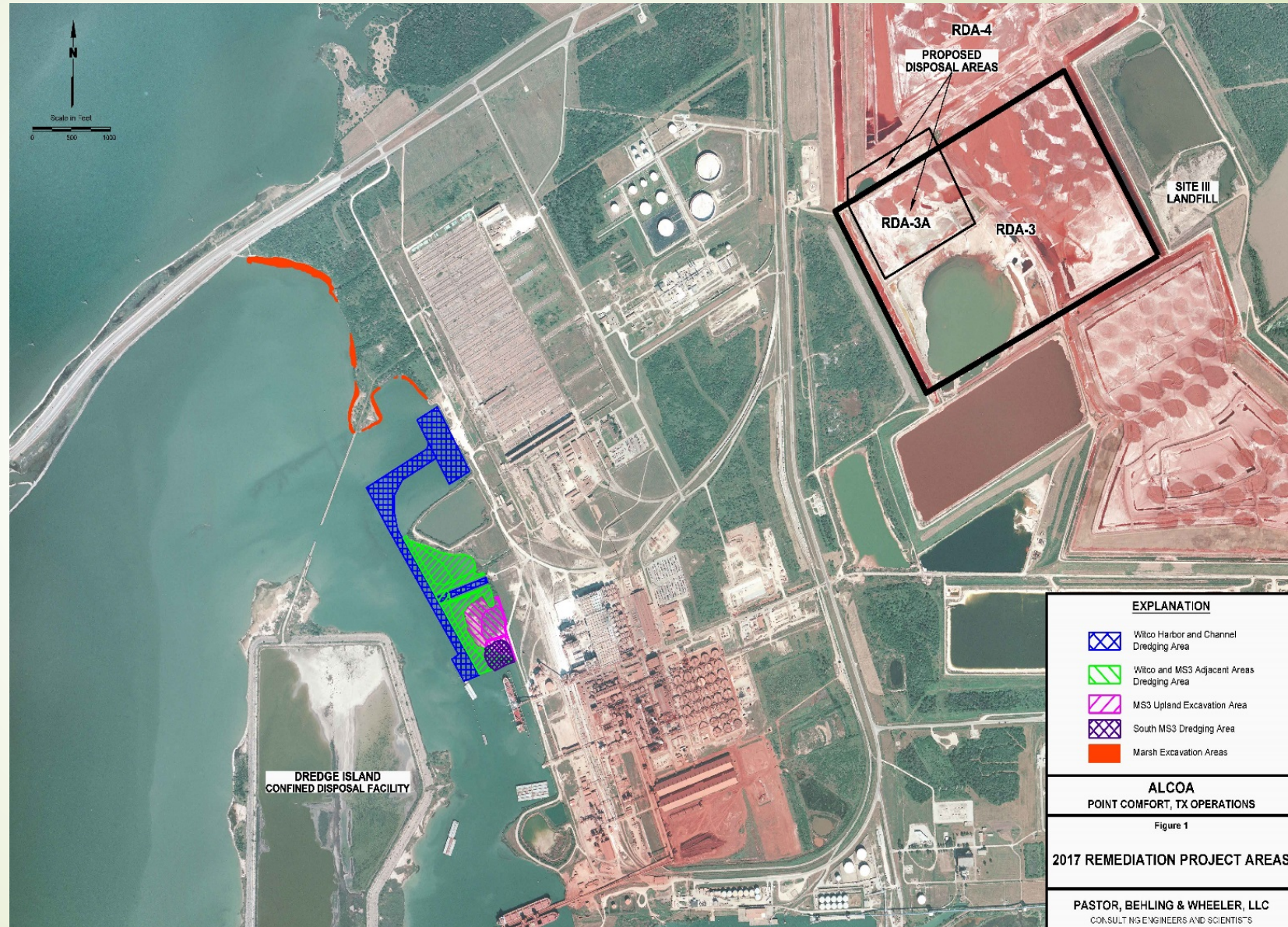
Jan-Feb (Complete)

Remove approximately 15,000 cubic yards of marsh sediments from Causeway Cove

May - October

Dredge/excavate 61,000 cubic yards of sediments/soils from Mainland Shoreline #3 Upland

Dredge up to approximately 300,000 cubic yards sediment from Witco Channel/Harbor, Mainland Shoreline #3 Marshes and adjacent areas



Planned 2017 -21 Monitoring and Reporting Activities

► 2017-18

- Assess data and report in Remedial Action Annual Effectiveness Reports (RAAERs)
- Annual sediment and fish/shellfish monitoring
- Assess data to determine if additional response action required

► 2019

- Assess data and report in annual RAAER
- During 2nd Quarter EPA prepares Addendum to 2nd Five-Year Report
- Annual sediment and fish/shellfish monitoring
- Assess data to determine if additional response action required

► 2020-21

- Assess data and report in annual RAAERs
- Annual sediment and fish/shellfish monitoring, unless otherwise modified
- 2nd Quarter 2021:EPA prepares 3rd Five-Year Report



